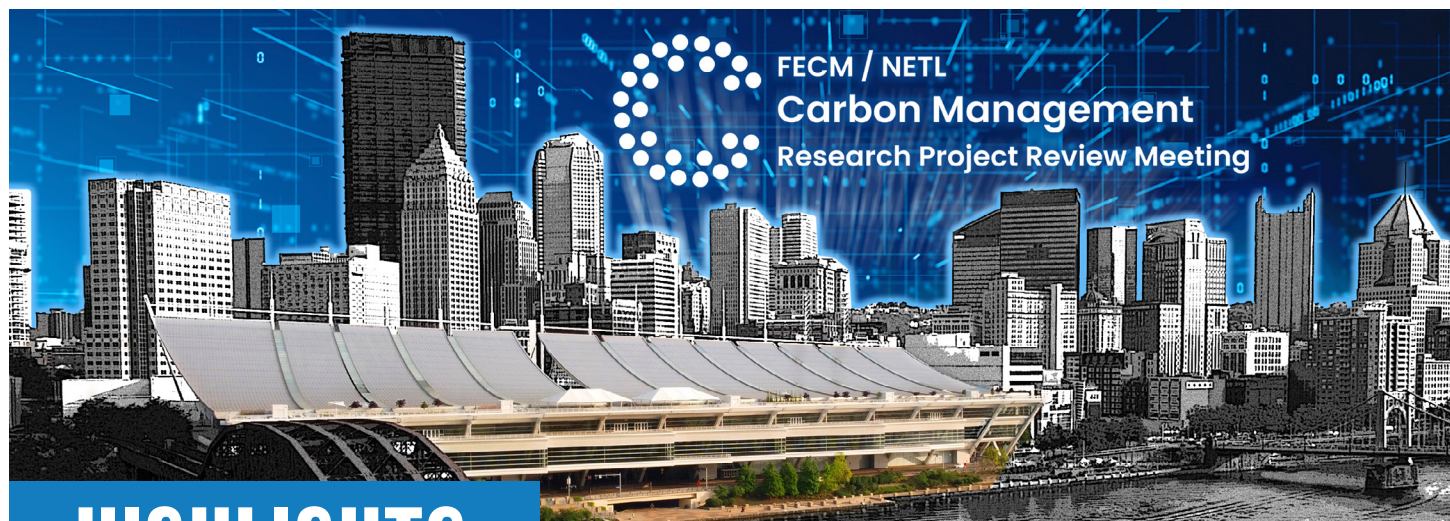


AUGUST 2024

CARBON CAPTURE NEWSLETTER



HIGHLIGHTS

The newsletter is compiled by the National Energy Technology Laboratory to provide information on recent activities and publications related to carbon capture.

To subscribe, [click here](#).

2024 FECM/NETL Carbon Management Research Project Review Meeting

Registration is open for the 2024 Office of Fossil Energy and Carbon Management (FECM)/National Energy Technology Laboratory (NETL) Carbon Management Research Project Review Meeting, to be held Aug. 5–9, 2024, in Pittsburgh, Pennsylvania. This meeting will provide attendees a chance to share in the knowledge and insights gained by more than 150 U.S. Department of Energy (DOE)-sponsored research and development (R&D) projects from the following programs: Point-Source Carbon Capture (PSCC), Carbon Dioxide Removal (CDR), Carbon Conversion, and Carbon Transport and Storage. A mixture of plenary, multi-topic breakout, and interactive poster sessions will be used to share research results and provide opportunities for discussion and collaboration on research efforts, both domestic and international. In addition to the project researchers, participants may include employees of other government agencies, electric utilities, research organizations and industry. The full meeting is open to the public, including foreign national attendees, and will consist solely of publicly available information. The meeting agenda is available [here](#).

Interagency News and Updates

NETL DAC Center Begins Testing, Seeks Partnerships

NETL's one-of-a-kind Direct Air Capture (DAC) Center—housed at the laboratory's research campus near Pittsburgh, Pennsylvania—has commenced material-scale operations and is

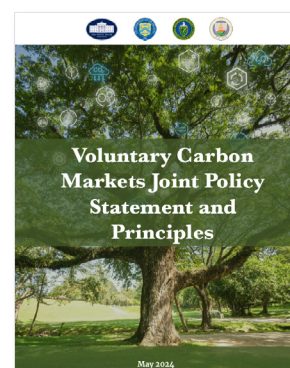


NETL DIRECT AIR CAPTURE CENTER

eager to expand partnerships with innovators from government, academia and the private sector that are interested in commercializing DAC technology. The function of the DAC Center, when fully operational next year, is to provide testing of DAC units under conditions representing the extreme ranges of climate within the contiguous United States, at scales up to a small pilot. Partners will have access to a nationally recognized center supporting DAC technology development and testing from invention to commercialization; inclusive, state-of-the-art testing facilities; collaborative access to NETL's world-class expertise; and standardized and bespoke testing options representing the “gold standard” in performance analysis. Find out more [here](#).

Biden-Harris Administration Releases Joint Policy Statement and Principles on Voluntary Carbon Markets

The recently released *Joint Statement of Policy and new Principles for Responsible Participation in Voluntary Carbon Markets (VCMs)* represents the Biden administration's commitment to advance responsible market practices that will help VCMs drive meaningful climate ambition and generate economic opportunity at home and abroad. VCMs are markets in which carbon credits—each representing one metric ton of carbon reduced or removed from the atmosphere—are bought and sold by companies, nongovernmental organizations, governments and others on a voluntary basis. VCMs can serve as an important source of revenue, enabling finance that advances decarbonization and provides critical economic support to many who need it.



NETL Fact Sheet: Understanding Scales and Capture Rates for Point-Source Carbon Capture Technology Development

A new NETL fact sheet explains how commonly used capture rate metrics should be interpreted for carbon capture pilot and demonstration projects.



DOE to Fund Carbon Management Projects, Meet Climate Change Challenges

FECM announced its intent to issue funding in support of R&D projects in cooperation with industry and academia to solve climate change challenges. The notice was made in anticipation of a sixth funding round for funding opportunity announcement (FOA) DE-FOA-0002614. The FOA will be both a multi-programmatic and multiyear FOA, potentially soliciting work in any, or all, of the following topic areas: carbon conversion, CDR, PSCC, and carbon transport and storage.



Interagency News and Updates (continued)

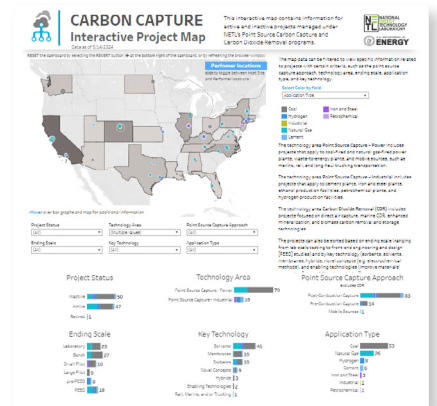
National Carbon Capture Center

The National Carbon Capture Center (NCCC) is working to accelerate the commercialization of advanced technologies to reduce greenhouse gas (GHG) emissions. View a site map and details of NCCC testing structure [here](#). The state-of-the-art facilities provide realistic industrial operating conditions and the infrastructure to evaluate promising technologies for scale-up and future commercial deployment. As a unique test bed for third-party developers, NCCC bridges the gap between laboratory research and large-scale demonstrations.



NETL's Carbon Capture Interactive Project Map

NETL's Carbon Capture Interactive Project Map includes all active projects in NETL's Carbon Capture Program in an interactive format divided into the technology areas of CDR, PSCC—Industrial and PSCC—Power. Project information can be explored by clicking on the icons, with links to additional project information available. Projects can also be sorted by Project Status, Approach, Ending Scale, Key Technology and Application Type via graphs and pull-down menus.



DOE Announces Funding to Accelerate America's CDR Industry

DOE announced 24 CDR Purchase Pilot Prize semifinalists to receive a total of \$1.2 million to scale up their CDR technologies. Funded by the Bipartisan Infrastructure Law (BIL), the CDR Purchase Pilot Prize allows companies to compete for the opportunity to deliver CDR credits directly to DOE. The 24 semifinalists will receive \$50,000 each to help scale diverse CDR approaches across four pathways: DAC with storage, biomass with CDR and storage, enhanced rock weathering and mineralization, and planned or managed carbon sinks. Modification 4 of the official prize rules—including revisions to Section 1 and 2, Phase 2 official rules, Phase 3 official rules, and updated appendices—are available [here](#).



DOE Announces Funding to Develop Carbon Conversion Pathways

FECD announced up to \$16 million in federal funding for large-scale conversion of CO₂ emissions into environmentally responsible and economically valuable products. With funding provided by the BIL, projects will develop the sustainable feedstocks and conversion technologies necessary to produce crucial fuels, materials and other carbon-based products that are better for the environment than current petroleum-derived equivalents. The FOA will support two areas of focus: (1) engineering-scale testing of electrochemical systems for converting CO₂ emissions into value-added products and (2) feasibility studies that examine retrofitting refineries and petrochemical facilities for carbon conversion. Read more details of this FOA [here](#). All questions about the FOA should be submitted to DE-FOA-0003018@netl.doe.gov. The application deadline is Aug. 27, 2024.



Interagency News and Updates (continued)

DOE Invests Funding to Provide Workforce Development Opportunities in Energy Communities

FECM announced \$1.4 million in federal funding for 14 local organizations and universities representing communities across the country that will each create a roadmap toward repurposing their existing energy assets. The Capacity Building for Repurposing Energy Assets initiative assists communities where a significant portion of their local economy has historically been supported by energy assets, such as coal, oil, and/or natural gas facilities and accompanying equipment and infrastructure. The 14 projects were selected to help communities build technical capacity and develop a workforce necessary to help revitalize energy systems, address environmental impacts, and tackle challenges associated with energy assets that have been retired or are slated for retirement.

NETL Carbon Capture Technologies Exhibited at Carbon Capture Technology Expo

NETL's portfolio of evolving carbon capture technologies that can help industries attain the nation's net-zero carbon emissions target were on display to a nationwide audience during the Carbon Capture Technology Expo North America on June 26–27, 2024, at the NRG Center in Houston, Texas. The event brought together engineering firms, technology manufacturers and suppliers, energy firms, the oil and gas sector, heavy industry, chemical companies, various manufacturing organizations, research groups, consultants, and government organizations to explore how the nation can rapidly accelerate the deployment and commercialization of CDR technologies. NETL's Peter Balash participated in the "Leadership Roundtable: Regulation of CO₂ Storage in North America: Managing Risk and Ensuring Compliance with Permits and Licenses."



FECM Releases Carbon Management Resource Portal

FECM released a Carbon Management Resource Portal—a user-friendly platform created to address the following objectives: provide information on the different technology areas that fall under the umbrella term “carbon management” for different knowledge levels; provide information in different formats (including videos, infographics, fact sheets, frequently asked questions [FAQs] and research articles); and provide a mechanism for the public to ask DOE experts questions about the information in this portal.



Interagency News and Updates (continued)

NOAA, DOE Sign MOA to Advance Marine CDR

The National Oceanic and Atmospheric Administration (NOAA) and DOE signed a [memorandum of agreement \(MOA\)](#) on future collaborations regarding marine CDR (mCDR) R&D. The MOA aims to combine the ocean science expertise of NOAA with the CDR and energy science and technology expertise of DOE to advance the state of mCDR science and strengthen the existing relationship between both agencies. Under the MOA, NOAA and DOE recognize four responsibilities: (1) coordination and collaboration; (2) acceleration of R&D infrastructure; (3) development of protocols for accountable and science-based mCDR for ecosystem safety, social benefit and economic viability; and (4) the potential for future additional collaboration between both agencies.

DOE STEM Portal

DOE is building pathways for a diverse workforce to pursue careers in science, technology, engineering and mathematics (STEM). DOE seeks to engage learners at all levels to promote STEM and energy literacy and to attract, inspire and develop a STEM identity and a sense of belonging in STEM. DOE is committed to promoting and supporting people from all backgrounds and perspectives, including individuals and communities that have been historically underrepresented in STEM fields and activities at DOE.

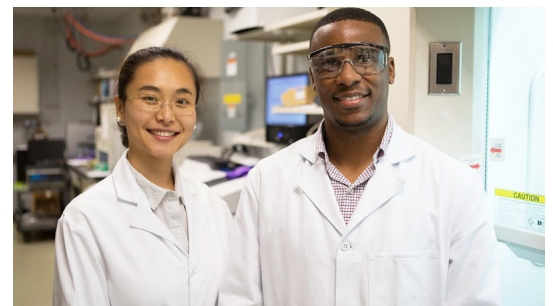


Explore Career Opportunities with FECM

FECM is looking for enthusiastic, driven professionals to join the team and help define the future of energy. Learn more about FECM's [Workforce Programs](#) and sign up for FECM career alerts to receive the newest vacancies. Text FECM CAREERS to 468311 to receive text message alerts or subscribe [here](#).

Explore Career Opportunities at NETL

At the core of NETL's success is its commitment to hiring the right people for the right positions. DOE's only government-owned and government-operated national laboratory offers exciting federal careers in research and engineering, technical project management, procurement, finance and budget, legal, and administrative support. Learn more at [NETL Careers](#).



Bipartisan Infrastructure Law Hub

The BIL represents the most dramatic changes to DOE since its founding in 1977. The BIL is standing up 60 new DOE programs, including 16 demonstration and 32 deployment programs, and is expanding funding for 12 existing research, development, demonstration and deployment programs. NETL's [BIL Hub](#) provides information on the BIL, including links to the Guidebook, DOE's Clean Energy Corps, DOE's Applicant Portal and DOE's Grid Resilience Program, as well as information on solicitations and funding opportunities.



U.S. and International Events

Conference: FECM/NETL Carbon Management Research Project Review Meeting

The FECM/NETL Carbon Management Research Project Review Meeting, to be held Aug. 5–9, 2024, in Pittsburgh, Pennsylvania, will provide attendees with a chance to share in the knowledge and insights gained by more than 150 DOE-sponsored R&D projects from the FECM R&D programs: PSCC, CDR, Carbon Conversion, and Carbon Transport and Storage. A mixture of plenary, multi-topic breakout, and interactive poster sessions will be used to share research results and provide opportunities for discussion and collaboration on research efforts, both domestic and international.



Conference: Carbon Capture Global Summit

The Carbon Capture Global Summit, to be held Sept. 3–4, 2024, in London, England, is dedicated to advancing the journey toward net zero by unlocking the transformative potential of carbon capture, utilization and storage (CCUS) technology. By bringing together policymakers, industry leaders, and public and private sector investors, the summit will enable in-depth discussions on global CCUS strategy, the latest policy frameworks, financial incentives, supply chain development, innovation, technology and international cooperation.



Conference: Climate Week NYC

Climate Week NYC, to be held Sept. 22–29, 2024, in New York, New York, is one of the key summits on the international calendar and has been driving climate action forward since it was first launched by Climate Group in 2009. Climate Week NYC brings together international leaders from business, government and civil society to showcase the unstoppable momentum of global climate action.



Conference: GHGT-17

The 17th Greenhouse Gas Control Technologies (GHGT) Conference, to be held Oct. 20–24, 2024, in Calgary, Alberta, Canada, is the principal international conference on GHG mitigation technologies. The GHGT conferences are held every two years in member countries, rotating between North America, Europe and Asia. Each conference is a forum for technical discussions related to the field of GHGT.



Carbon Capture Technology Expo Europe

Carbon Capture Technology Expo Europe, to be held Oct. 23–24, 2024, in Messe Hamburg, Germany, is a solutions-driven forum that will discuss the development of new carbon capture technologies and propel carbon capture into the mainstream for stationary and mobile applications. The two-day event will explore how to rapidly accelerate the deployment and commercialization of CDR technologies as a key solution on the pathway to net-zero carbon emissions.



U.S. and International Events (continued)

Conference: Deploy24

Hosted by DOE, Demonstrate Deploy Decarbonize 2024 (Deploy24) will be held Dec. 4–5, 2024, in Washington, D.C. Deploy24—the second annual gathering of decision-makers from across the private and public sectors—is focused on accelerating the deployment of critical energy and decarbonization technologies and supply chains in the United States. Deploy24 builds this private-public dialogue through a range of formats, all with a focus on the immediate opportunities and challenges to accelerating domestic energy transformation.



Business and Industry News

NCCC Teams with CORMETECH on Critical Carbon Capture Testing

NCCC announced that testing of CORMETECH's lower-cost transformational technology—designed to capture at least 95% of CO₂ from the flue gas of natural gas combined-cycle (NGCC) power plants—commenced at the center in June 2024. CORMETECH's new PATHFINDER™ Point-Source Capture (PSC) Integrated Process Demonstration Unit will begin large bench-scale testing and optimization of CORMETECH'S unique, low-cost integrated process technology for PSC utilizing its proprietary CORAL™ Solid CO₂ Adsorber Technology. The project is partly funded by an FECM/NETL \$2.5 million award.



Meta and Georgia Tech Use AI to Advance Carbon Capture Solutions

Meta and the Georgia Institute of Technology have created a massive open dataset to advance artificial intelligence (AI) solutions for carbon capture. The open-source database enabled the team to train an AI model that is orders of magnitude faster than existing chemistry simulations. The project, named OpenDAC, could accelerate climate solutions. The team's [research](#) was published in ACS Central Science.

Business and Industry News (continued)

Dry Fork Station to Be World's Largest Carbon Capture Facility

A carbon capture research laboratory near the Dry Fork Station power plant, outside Gillette, Wyoming, is part of a strategic collaboration between the University of Wyoming's (UW) energy research division and a California-based filtration company, which recently received funding from DOE. The partnership between Newark, California-based Membrane Technology and Research Inc. and UW's School of Energy Resources was awarded \$4.6 million. This funding supports their innovative work on capturing and storing CO₂ at one of the country's newest and most advanced coal-fired power plants.



Dry Fork Station power plant, near Gillette, WY.

Heirloom to Build Two DAC facilities in Northwest Louisiana

Heirloom announced an investment in Louisiana that will bring two DAC facilities, with a combined ability to remove nearly 320,000 metric tons of CO₂ per year, to the northwestern part of the state. The new facilities will be located at the Port of Caddo-Bossier in Shreveport and will create around 1,000 new clean energy jobs, powering the Gulf Coast's leadership in DAC technologies. The first facility will begin construction later this year and—once operational starting in 2026—will remove around 17,000 metric tons of CO₂ year. The second facility is under design as part of Project Cypress, the Regional DAC Hub in Louisiana managed by DOE's Office of Clean Energy Demonstrations, which is eligible for up to \$600 million in funding. This expands the footprint and job-creation potential of Project Cypress beyond Southwest Louisiana, where Climeworks is building its Project Cypress facility in Calcasieu Parish.



Heirloom

Publications

Crystal Engineering of Hydrogen Bonding for Direct Air Capture of CO₂: A Quantum Crystallography Perspective

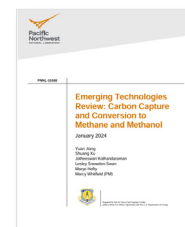
Sylwia Pawlędzio, Xiaoping Wang, Crystals, VOLUME 14, ISSUE 1, JAN. 13, 2024.



crystals

Emerging Technologies Review: Carbon Capture and Conversion to Methane and Methanol

Yuan Jiang, Shuang Xu, Jotheeswari Kothandaraman, Lesley Snowden-Swan, Marye Hefty, Marcy Whitfield, PACIFIC NORTHWEST NATIONAL LABORATORY, JAN. 31, 2024.

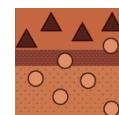


Investigation of a Hybrid Carbon Capture System at a NGCC Power Plant That Performs Direct Air Capture During Off-Peak Hours

Katherine Hornbostel, ADVANCED RESEARCH PROJECTS AGENCY–ENERGY, JAN. 24, 2024.

Field-Scale Testing of a High-Efficiency Membrane Reactor (MR)—Adsorptive Reactor (AR) Process for H₂ Generation and Pre-Combustion CO₂ Capture

Nicholas Margull, Doug Parsley, Ibubeleye Somiari, Linghao Zhao, Mingyuan Cao, Dimitrios Koumoulis, Paul K. T. Liu, Vasilios I. Manousiouthakis, Theodore T. Tsotsis, MEMBRANES, VOLUME 14, ISSUE 2, FEB. 11, 2024



membranes

High-Capacity, Cooperative CO₂ Capture in a Diamine-Appended Metal–Organic Framework through a Combined Chemisorptive and Physisorptive Mechanism

Ziting Zhu, Hsinhan Tsai, Surya T. Parker, Jung-Hoon Lee, Yuto Yabuuchi, Henry Z. H. Jiang, Yang Wang, Shuoyan Xiong, Alexander C. Forse, Bhavish Dinakar, Adrian Huang, Chaochao Dun, Phillip J. Milner, Alex Smith, Pedro Guimarães Martins, Katie R. Meihaus, Jeffrey J. Urban, Jeffrey A. Reimer, Jeffrey B. Neaton, Jeffrey R. Long, JOURNAL OF THE AMERICAN CHEMICAL SOCIETY, VOLUME 146, ISSUE 9, FEB. 24, 2024.



About DOE Carbon Capture:

DOE/NETL is developing the next generation of advanced CO₂ capture technologies through NETL's Point Source Carbon Capture Program (PSCC) and advancing a diverse set of CDR approaches to directly remove CO₂ emissions from the atmosphere through NETL's Carbon Dioxide Removal Program.



The Digital Compendium of Carbon Capture Technology provides a technical summary of the DOE/NETL's Carbon Capture Program, assembling carbon dioxide capture technology research and development (R&D) descriptions in a searchable database.



Carbon Capture Reference Materials

- Point Source Carbon Capture Program Fact Sheet
- Carbon Dioxide Removal Program Fact Sheet
- Carbon Capture Infographics
- Interactive Project Maps: PSCC and CDR
- Compendium of Carbon Capture Technology
- Carbon Dioxide Capture Handbook
- CCSI²
- Systems Analysis
- Conference Proceedings
- Accomplishments Posters: PSCC and CDR

Contact Us

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Rory Jacobson, Acting Division Director Carbon Dioxide Removal, 240.805.7382

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Program staff are also located in **Houston, Texas** and **Anchorage, Alaska**

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There are several ways to join the conversation and connect with NETL's Carbon Capture activities:

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